CHAPTER 7

LAUNDRY, MESS DECK, GALLEY, AND SCULLERY EQUIPMENT

This chapter presents some information on ways to maintain, repair, and troubleshoot the common types of equipment in the laundry, mess deck, galley, and scullery. Because of the differences in types of equipment you are expected to maintain, only general information is presentedin this chapter. Remember, you should study the manufacturer's manual that comes with the equipment before you attempt to maintain it. Although Enginemen are not the operators of this equipment, you as an Engineman are responsible for any repairs, replacements, or adjustments of this equipment. The exception is where there is a need for any electrical work

Because you are familiar with this equipment, you can help the operator learn to properly clean and maintain these pieces of equipment. Laundry, mess deck, galley, and scullery equipment should have assigned PMS requirements.

For any particular information on laundry, mess deck, galley, and scullery equipment, refer to the equipment's technical manual or the *Naval Ships' Technical Manual (NSTM),* Chapter 655, "Laundry," and Chapter 9340, "Commissary Equipment."

LAUNDRY EQUIPMENT

All laundry equipment must be in good operating condition, especially on deploying ships that stay at sea most of the time. It is also important that all safety devices that protect the equipment and operator are working. Safety devices that are not working, or that have been removed for any reason, must be replaced before they can be used.

NAVSEA S6152-B1-CAT-010 is a technical manual catalog for Navy laundry and dry-cleaning equipment. This catalog lists standard laundry and dry-cleaning equipment identified by national stock numbers, allowance parts lists, and part numbers. You should obtain a copy of this catalog. Currently, the Naval Supply System supports approximately 600 different laundry equipment types, most of which are now obsolete. You can help reduce this number by assisting in the selection of the standard items described in this catalog.

WASHING MACHINES

You can avoid problems with washing machines if the operator will do the following:

– Do not overload the machine.

Strictly follow the operating instructions.

Report to the auxiliary or repair division any malfunctioning safety device and any abnormal condition, such as excessive vibration, leaks, or missing parts.

Wipe all excess oil, dirt, and laundry supplies from the machine at the end of each day.

Inspections

Inspect washing machines at regular intervals to ensure that they work properly. If an inspection reveals adjustments or repairs are needed, make them promptly. Some of the important items to be covered in an inspection are as follows:

1. Ensure the machine is level.
2. See that bolts, nuts, and screws are tight.
3. See that latches on cylinder doors work properly.
4. Make sure the thermometers are accurate.
5. Have an electrician check the switches to be sure they are properly adjusted and working correctly.
6. Have an electrician check the timer to ensure it is in working order.
7. Check water level gauges to determine if they are correct.
8. Have an electrician check all the controls to be sure they are working properly.

Maintenance, Repairs, or Overhauls

You should prevent water from entering gear casings on washing machines. To do this, make sure all gear gasket covers and stuffing boxes are tight. Examine and lubricate, at frequent and regular intervals, all the bearings and gearing. Advise the division responsible for the equipment that any requests for repairs and parts replacements must be submitted on Ship's Maintenance Action Form, OPNAV 4790/2K. By following this procedure, you can determine what part or parts are failing. And, you will have clear documentation of all requested parts and repairs. You should follow the applicable MRCs for maintenance.

TUMBLER DRYERS

A properly maintained and not overloaded tumbler dryer will dry a load of laundry in approximately 20 minutes. If drying is not completed within this period, you should look for the following conditions or troubles:

- Has the water from the laundry been properly extracted?
- Is the tumbler overloaded?
- Are the lint screens clean?
- Is there enough steam pressure?
- Is the tumbler rotating in the right direction?

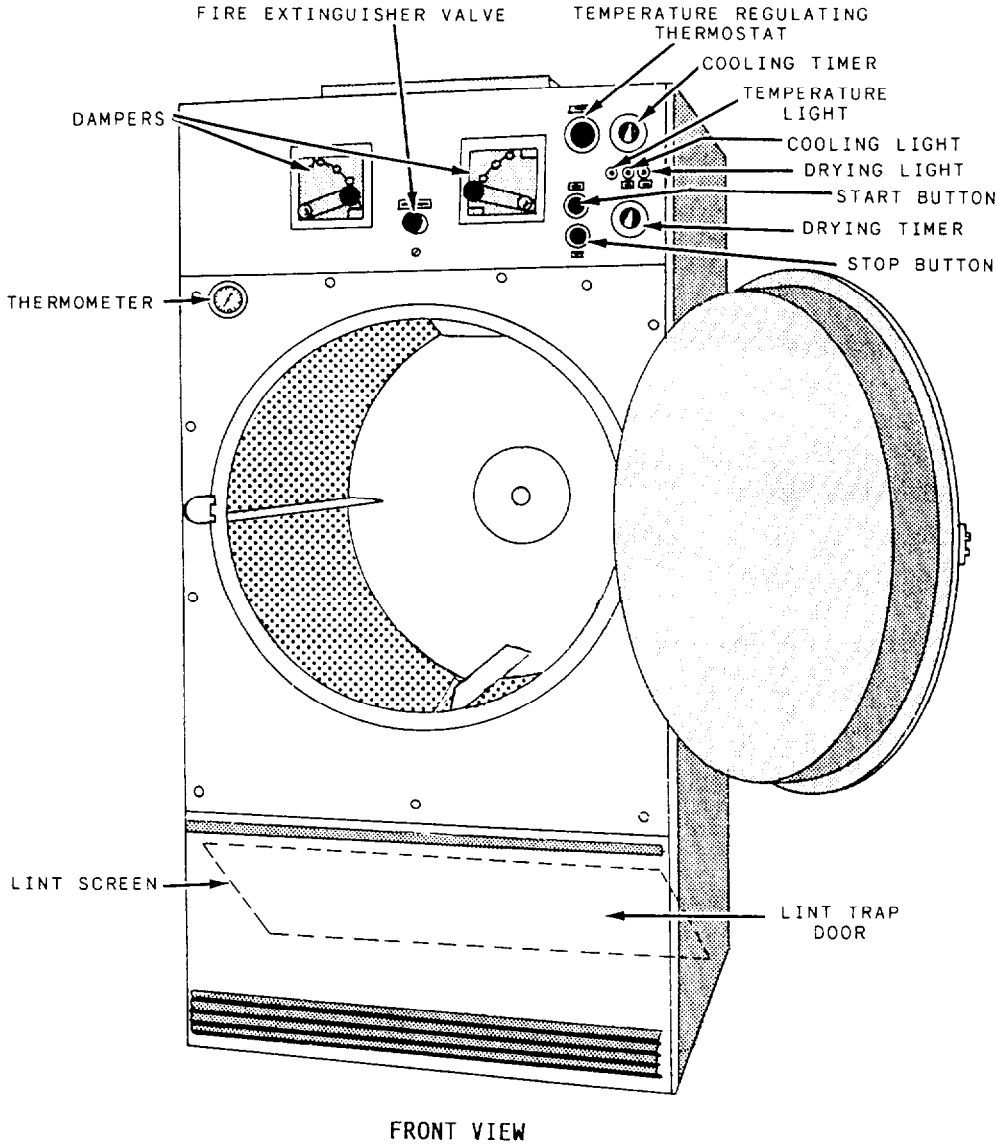

Figure 7-1.—A front view of a typical shipboard laundry dryer.

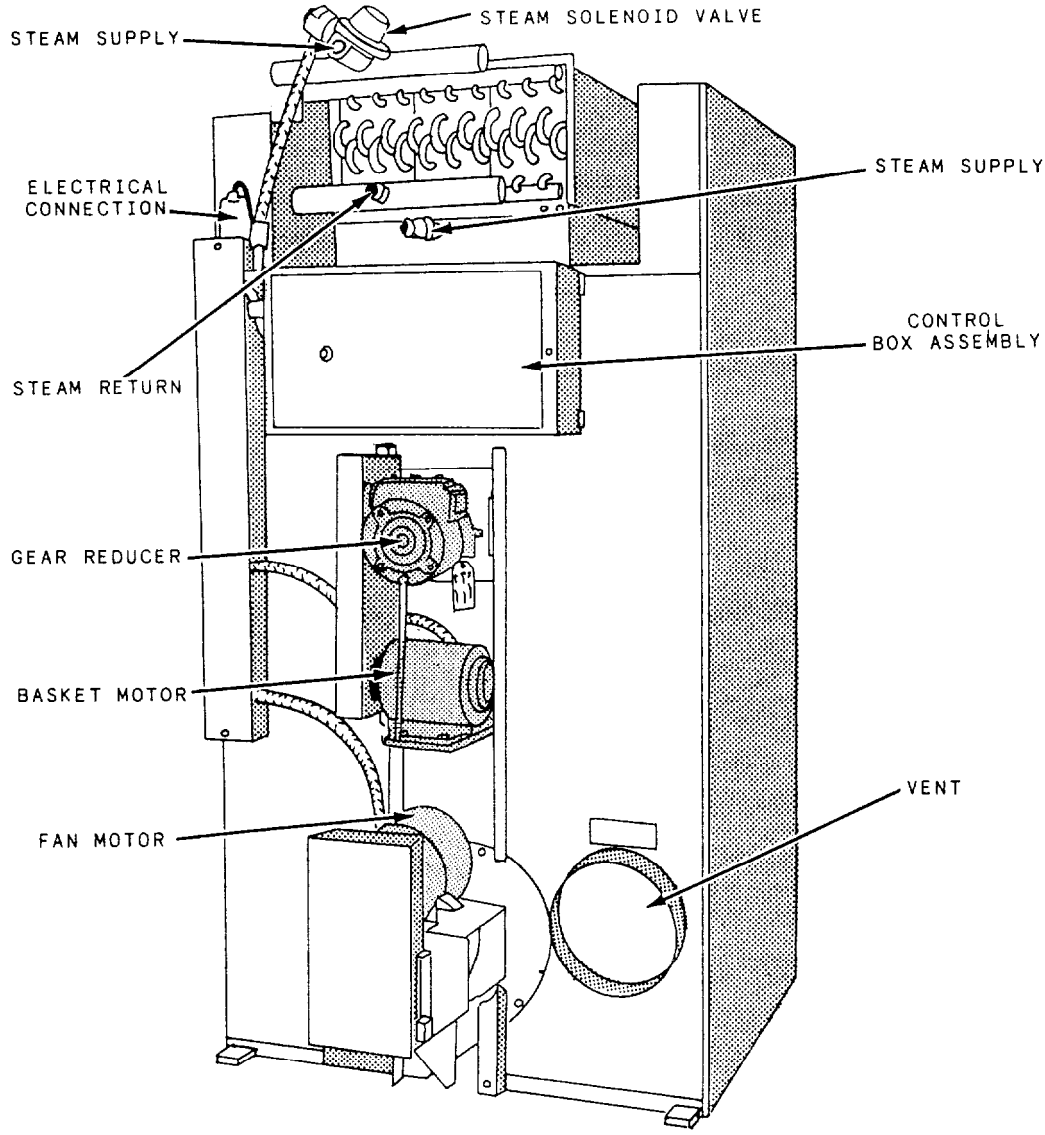

Figure 7-2.—A rear view of a typical shipboard laundry dryer.

Figures 7-1 and 7-2 illustrate a typical shipboard laundry dryer. You should pay particular attention to the location of the parts.

Troubleshooting

Tables 7-1 and 7-2 list some common troubles, causes, and remedies on shipboard laundry dryers. These tables do not replace any procedures on your shipboard dryer manuals, nor do they replace the procedures specified by the equipment's PMS.

Repairs or Overhauls

You should lubricate all dryer bearings at regular intervals according to the manufacturer's technical manual. Advise the division responsible for the equipment to submit the request for repairs and parts replacements on Ship's Maintenance Action Form, OPNAV 4790/2K. This procedure will help you determine parts that are failing and provide you with documentation of repairs. You should follow the applicable MRCs for maintenance.

LAUNDRY PRESSES

Some ships are equipped with air-operated presses and others with steam-operated presses. But both types of presses use steam for heating. The trouble the operator will most often encounter is insufficient supply of air pressure for the air-operated presses, and not enough steam pressure for the steam-operated laundry

Table 7-1.—CommonTroubles, Causes, and Remedies on Shipboard Laundry Dryers

TROUBLE	CAUSE	REMEDY
No steam to steam bonnet	Trap installed incorrectly	Check trap for inlet and outlet markings. Install trap according to markings.
	Supply line valve closed	Open valves in supply and in the return lines.
	Check valve installed incorrectly	Check for inlet and outlet marking on check valve, and invert if necessary.
	Strainer clogged	Remove plug and blow down strainer or remove and clean thoroughly if heavily clogged.
Water in steam line	Steam piping installed incorrectly	Check piping per steam installation instructions.
	Trap not functioning	Check trap for size and capacity. If dirty and sluggish clean thoroughly or replace. Check return line for high back pressure, or another trap charging against the trap functioning improperly.
Motors won't start	No power	Check fuses on circuit breakers, make sure main control switch is on. Request an electrician.
	Incorrect current	Check power source. Voltage, phase, and frequency must be the same as specified on electrical rating plate. Request an electrician.
	Time off Overload relays tripped	Turn timer clockwise to desired time setting. Rush reset buttons on control box. Request an electrican.
	Loose wiring Connections	Check all terminal connections. Request an electrician.
	Defective starting relay	Check coils and contacts. Request an electrician.
Fan motor only runs	Loading door open	Close door.
	Door switch out of adjustment	Adjust switch by removing cover and bending actuator lever to clear switch button 3/8" with cover in place.
	Defective Door switch	Replace switch.
Dryer runs no steam to coils	Valves closed	Check all valves in steam supply & return to make sure they are open.
	Steam trap blocked	Remove and clean. Replace if defective.

presses. Both types of presses require the right amount of steam pressure for heating. You, as the maintenanceman, must make sure safety devices are not bypassed. All press heads and bucks should be hydrostatically tested annually as specified by the manufacturer's manual. If not specified in the manufacturer's manual, test to 150 lb/sq. inch according to chapter 655 of *NSTM* for 1 minute.

Table 7-2.—Common Troubles, Causes, and Remedies on Shipboard Laundry Dryers-Continued

TROUBLE	CAUSE	REMEDY
Dryer runs, steam passing through coil, dryer doesn't heat.	Inadequate venting Inadequate makeup air Lint trap blocked	Proper operation of steam dryers depends on air flow through the coils. Venting must be done with the least possible restriction. Make up air opening of at least 350 sq. inches free area must be available in the vicinity of the dryer to replace the air being exhausted out by the dryer. Lint traps must be kept clean.
	Coil fins clogged with lint	Coil fins must be kept clean.
	Steam supply & return	Must be properly installed and adequately sized. See piping installation sheet.
	8-stage heat control	Check for loose dampers. Adjust dampers and tighten set screw in contol handle.
Tumbler Noisy or Vibrating	Not level	Check manual for proper leveling procedure.
	Fan out of balance	Accidental damage to the fan blade can change the dynamic balance. Damaged fans should be replaced.
	Basket rubbing V-Belt sheaves	Adjust basket clearances. Tighten set screws. Make sure sheaves are in proper alignment.
	Belt	Adjust belt tension.
	Foreign objects	Occasionally screws, nails, etc. will hang in the basket perforations and drag against the sweep sheets surrounding the basket. Such foreign objects should be removed immediately.

You should lubricate all bearings, the dashpot, and the air cylinder regularly as specified by the manufacturer's manual or by the applicable MRCs. Advise the division responsible for the equipment to submit requests for repairs and parts replacements on Ship's Maintenance Action Form, OPNAV 4790/2K. This procedure will help you, as the maintenanceman, track the parts that are failing and provide you with documented repairs. The maintenance of all laundry presses should be according to the applicable MRCs.

MESS DECK EQUIPMENT

Common mess deck equipment on most Navy ships is either used for chilling or warming foods. For chilling foods, there are salad bar tables, beverage dispensers, and milk dispensers. Some of the troubles that a maintenanceman may encounter on this equipment are too much frost buildup, not getting cold, or not working at all. Some problems can easily be corrected or prevented by training the operator on the proper usage of the machine. Trained personnel can avoid troubles by correctly loading refrigerators, properly securing the dispenser door, and using proper defrosting techniques. Improper defrosting, such as the use of a pointed object to scale out thick frost buildup, often results in pin holes on the cooling coil and loss of refrigerant charge. If you train and encourage mess deck operators to practice proper equipment use and maintenance, your job and theirs will be easier.

For warming foods, there are electric and steam-operated food warmers. Troubles with steam-operated warmers are normally either not getting enough steam pressure or not getting any steam at all. You as a maintenanceman can troubleshoot this by inspecting the steam line and checking it for leakage or restrictions such as water in the steam line. Restrictions can be detected by a hammering noise in the line. When bleeding a steam line, be sure you are well protected by wearing a face shield and thick gloves. To release any water trapped inside the steam line, you should slowly

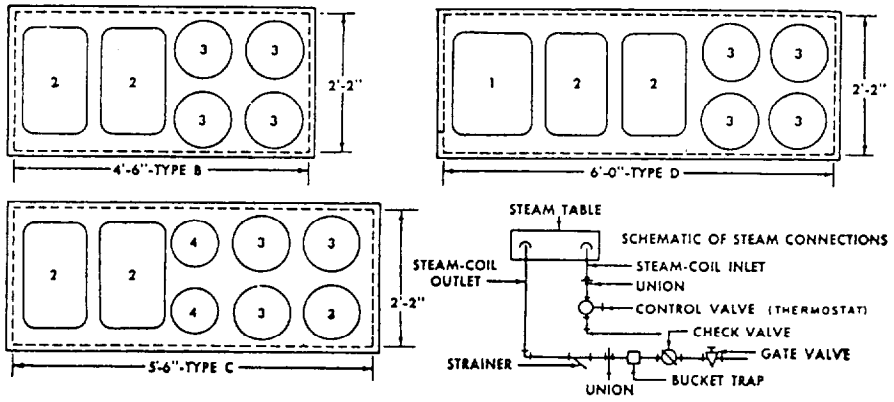

Figure 7-3.—Schematic drawing of a steam table.

open or lift the bleeder valve. Figure 7-3 is a typical schematic drawing of a steam table. Notice the steam table's piping system in this figure.

The food service division is responsible for routine preventive maintenance of all mess deck equipment. Any major troubleshooting, repairs, or overhauls are the responsibility of the repair or auxiliary division. You should advise the division responsible to submit all requests for repairs and parts replacements on Ship's Maintenance Action Form, OPNAV 4790/2K.

GALLEY EQUIPMENT

Galley equipment must be maintained in a safe, sanitary, and economical way. Enginemen maintain this equipment, and they frequently tram the food service personnel on how to properly operate the equipment. It is always a good practice to post operating instructions near the equipment. This will help to ensure that the operators do not abuse the machines. You may be called on to help inspect galley equipment. You can also help determine the type of maintenance and the extent of repairs required to keep the equipment safe and efficient. Remember, the medical department is responsible for conducting sanitary inspections. The supply department is responsible for keeping food-handling equipment clean. And, the engineering department is responsible for maintaining the operation of this equipment.

REFRIGERATORS (SELF-CONTAINED)

Galley refrigerators will not have any problems if the user will do the following:

- Allow proper clearance in the back of the refrigerator. The refrigerator must have a distance of at least 4 inches away from the bulkhead. Any obstruction will reduce the airflow required for an air-cooled condenser.
- Do not overload the refrigerator.
- Properly store foods with space for air circulation.
- Follow the MRC for routine maintenance like defrosting and cleaning.
- Do not use any sharp objects like knives or scrapers when defrosting the refrigerator. This is not an acceptable procedure for removing frost buildup on a refrigerator.

When repairing or overhauling a refrigerator, refer to the manufacturer's manual. "Refrigeration System," Chapter 516 of *NSTM* contains general procedures on how to maintain or repair a self-contained refrigerator. Follow all the necessary safety precautions when handling and disposing of a refrigerant!

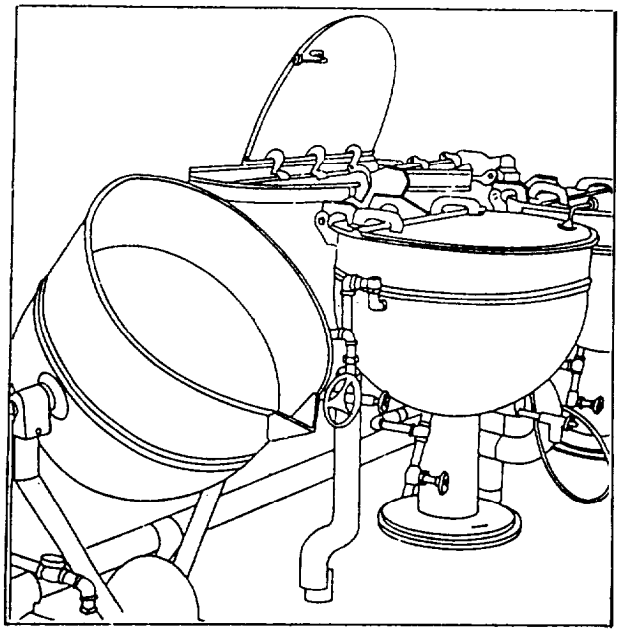

Figure 7-4.—An arrangement of steam-jacketed kettles.

STEAM- JACKETED KETTLES

Kettles require, as a minimum, monthly inspections. Figure 7-4 illustrates an arrangement of shipboard steam-jacketed kettles. An annual preventive maintenance inspection is also important. Here are a few factors to keep in mind while inspecting steam-jacketed kettles.

When making a MONTHLY inspection, check the draw-off faucets, valves, and piping for leaks. Check the steam pressure-reducing valve to ensure it is in good condition and is functioning properly. Lubricate the hinges of the kettle cover with mineral oil.

During the ANNUAL inspection, check each kettle for leaks, cracks, and dents. Examine the cover, hinges, and latch for warp and alignment. Check the steam piping and the condensate piping, the valves, and the traps for leaks and obstructions. Remove the safety valves; then clean, lubricate, and calibrate them before reinstalling. Remove any rust and corrosion by using Navy approved solvents. Other than visual inspections, each individual piece of galley equipment requires its own type of preventive maintenance.

During each ship's regularly scheduled overhaul, steam-jacketed kettles should be tested using the following procedure:

1. Put each kettle into a cold-water pressure test of 90 psi for not less than 30 minutes.

2. Check the safety valves on each kettle. The testing of safety valves should he covered by the PMS. In general, kettle safety valves are set to release at a pressure of 45 psig.

3. Replace kettles that are cracked, badly pitted, or bulge under a pressure test.

4. Replace all malfunctioning safety valves.

Table 7-3 shows some common troubles and repair recommendations on steam-jacketed kettles and other steam-heated equipment.

Table 7-3.—Common Troubles and Repair Recommendations on Steam-Jacketed Kettles and Other Steam-heated Equipment

Inspection Point	Symptoms	Time	Possible Troubles/Causes	Possible Corrections
Steam jacket	Not beating	When noted	No steam; valve stuck closed; trap malfunctioning	Check steam supply; free stuck valve
Steam jacket	Stays hot	When noted	Valve partly open or scored seat	Repair or replace valve
Steam jacket	Leaks	Monthly	Rapid changes in temperature causing cracks; faulty weld	Raise heat slower, reweld bust or crack
Pipe joints	Leaks	Monthly	Joints made incorrectly; not tight	Unscrew, clean and repair joint
Pipe joints	Corrosion	Monthly	Leaks or condensation	Repair and/or clean
Control valves	Stuck open or closed	When noted	No steam or too much steam; packing too tight or valve frozen	Loosen packing gland or free frozen valve stem
Control valves	Leaks at stem	Weekly	Packing not tight enough	Tighten packing
Condensate strainer	No flow	When noted	Restricted strainer	Clean strainer
Steam trap	Malfunctioning	Every 6 months	Parts dirty or worn	Disassemble, clean, and repair
Lagging	Broken or crushed	Quarterly	Water soaked; stepped on	Replace defective sections
Reducing valve	Incorrect pressure	When noted	Parts dirty or worn	Disassemble, clean, and repair; clean and adjust pressure every 6 months
Safety valve	Stuck open or lifting under pressure	When noted	Leaks or corrosion	Replace or repair valve
Covers	Tight operation	When noted	Hinges dirty	Clean and lubricate binges
Drawoff valve	Leaks	When noted	Scored	Resurface or replace. DO NOT REPLACE WITH REGULAR GATE VALVE

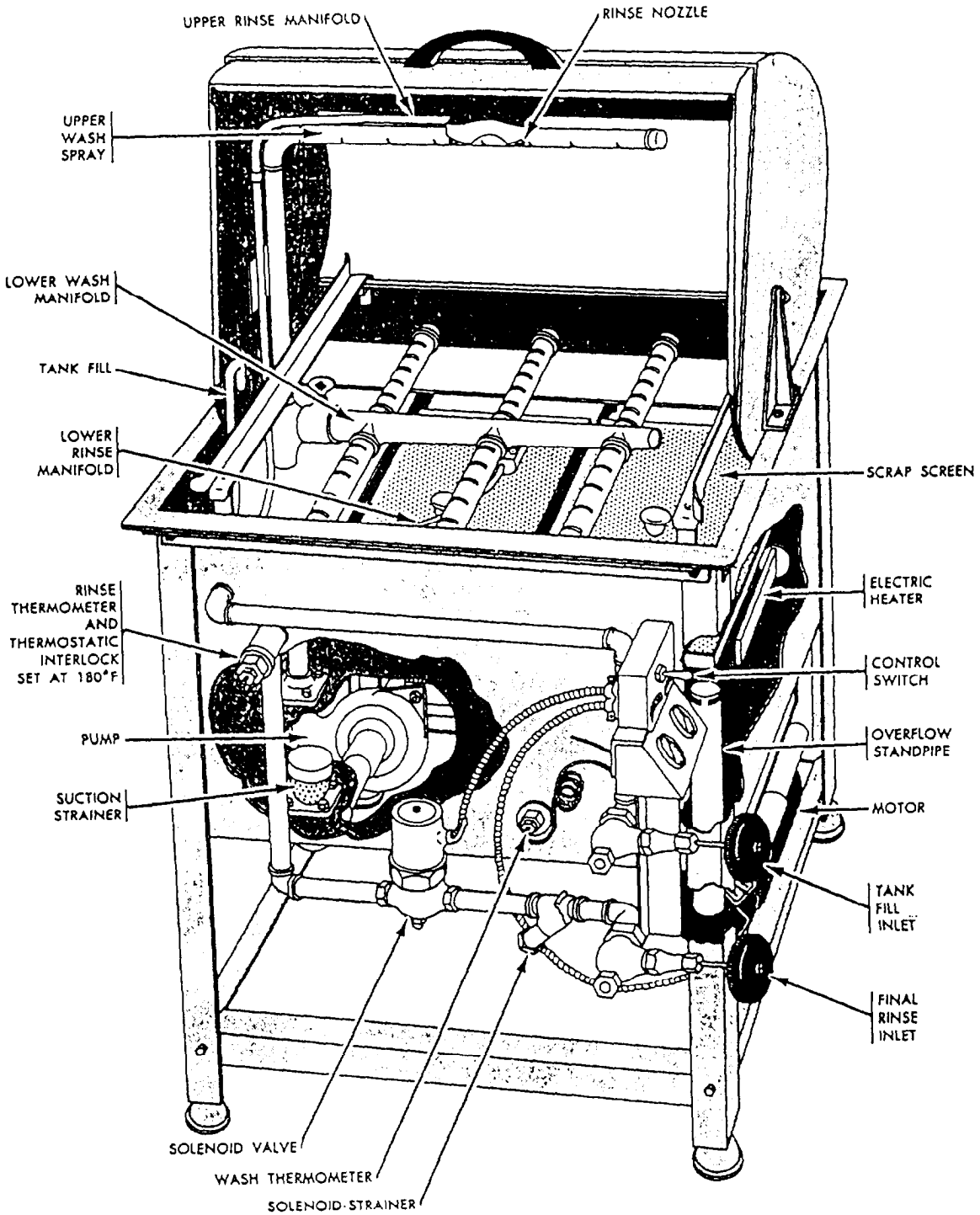

Figure 7-5.—Semiautomatic singie-tank dishwasher machine for use in and messes.

SCULLERY EQUIPMENT

You must read the manufacturer's instruction book for each machine and become familiar with all its operating characteristics and its basic design. If routinely cleaned, descaled, and properly maintained, scullery machines will not have any problems. But these procedures must be done on time as specified by the planned maintenance schedule or by the manufacturer's manual. Any necessary repairs and parts replacement requests must be submitted by the responsible division on Ship's Maintenance Action Form, OPNAV 4790/2K. Following this procedure and using this form will provide you, as the maintenance person, a document of repairs and parts that failed.

TROUBLESHOOTING

From time to time, you may be called upon to repair scullery machines that have become defective. Figures 7-5 and 7-6 illustrate the types of scullery machines used by the Navy. Some common difficulties, the usual reasons for their occurrence, and possible remedies for those difficulties are listed in table 7-4.

REPAIRS OR OVERHAULS

Scullery machines must be inspected by the maintenance personnel according to the PMS schedule. Listed here are some common inspections, maintenance, repairs, or overhauls you may encounter with these machines. You should perform the following:

1. Check the adjustment of tension on the *conveyor* chains if the machine is equipped with a conveyor. If the chain is equipped with lugs, make sure the lugs on both chains are directly opposite each other.

2. See that the guide sprockets are properly located on their shaft so that the conveyor chain will ride properly on the track assembly.

3. Inspect the operation of the doors and make sure all the counterweights are properly attached and the doors are held in the open position when raised.

4. Check the operation of thermometers, pressure gauges, thermostats, and automatic mixing valves or boosters.

5. Adjust the thermostat so that the machine will not start up unless the desired temperature is reached.

6. Inspect the pump packing and adjust as necessary to stop leakage around the pump shaft.

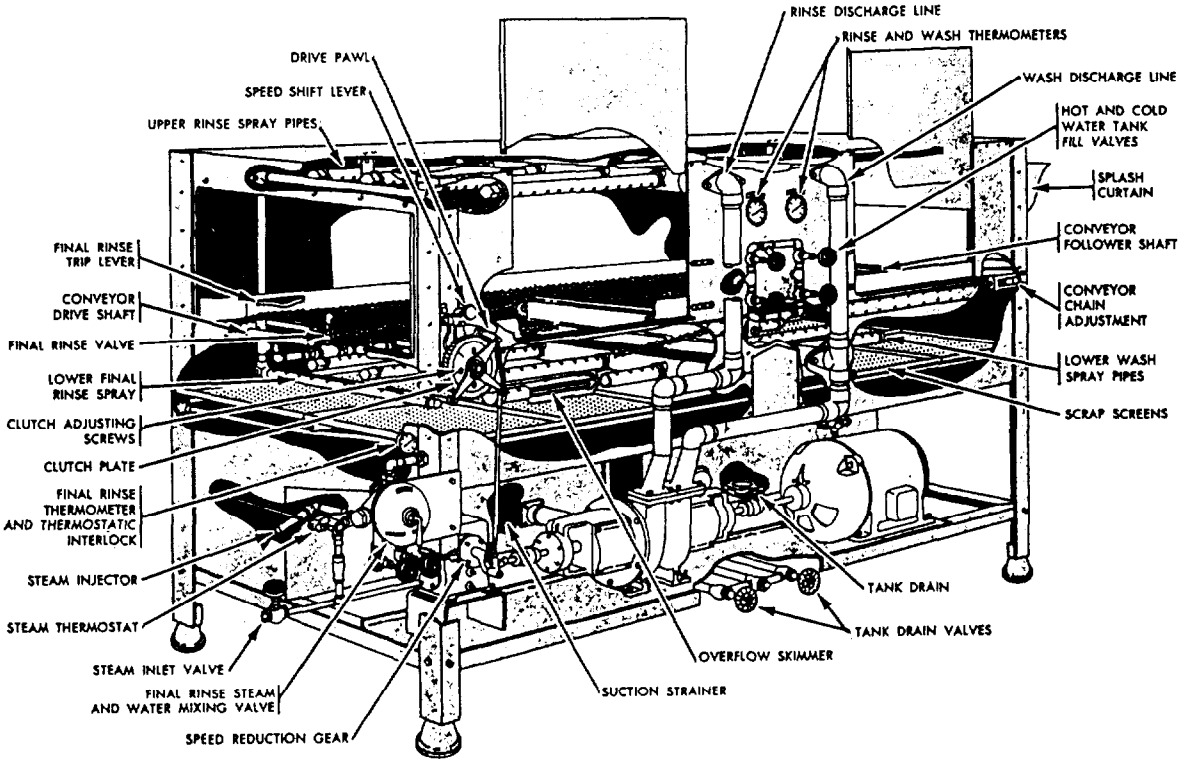

Figure 7-6.—Cutaway view of a double-tank automatic dishwasher.

7. Lubricate the motor and pump bearings.

8. Lubricate, as necessary, the gear reducer unit.

9. Lubricate the conveyor shaft bearings, drive mechanisms, sprocket chains, and so on.

10. Replace any missing lubrication fittings.

11. Inspect all steam and water valves.

12. Disassemble and inspect pumps internally for undue erosion or corrosion at least annually.

SUMMARY

This chapter has presented some general information on maintenance and repairs of laundry, mess deck, galley, and scullery equipment. Maintenance personnel should make use of the manufacturer's technical manual, the PMS, and other related *NSTMs,* which are furnished to all Navy ships.

Table 7-4.—Troubleshooting Chart for Scullery Machines

Trouble	**Probable cause**	**Possible remedy**
Dish racks slide off chain conveyor.	Change of tension on either chain.	Reset idler sprockets to proper tension on each chain.
Water pressure too low.	Spray nozzles or slot plugged. Strainer baskets plugged. Slipped belts on pumps.	Dismantle spray assembly. Wash out piping; clean parts. Disassemble and clean strainer. If belts are frayed or tom, replace them. Adjust tension by resetting idler pulley or by moving motor on sliding base.
Water splashing on floor or into wrong compartment.	Leaks around doors; torn curtains or curtains not in proper position.	Realign door. Repair or replace gasket. Repair or realign curtain. Readjust spray to keep it within limits of tank.
Rinse water temperature is less than 180°F.	Insufficient heat from booster heater.	Remove scale from steam coil. Correct leaking fittings. Calibrate or replace thermostat.
Spot or film on eating utensils after final rinse.	Wash water saturated with grease. Dirty tank Weak sprays in wrong direction. Improper detergent mixture.	Stop operation and clean all Equipment. Adjust speed of conveyor. Examine spray equipment. Clean nozzles, spray pipes, scrap trays, and strainers. Check piping for leaks. Check to see if valves are operating properly. Examine pump. Clean impeller if necesssary.